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Underemployment and Labor Force Reserves on Southeastern South Dakota Farms

Donald J. Biggar

UNDEREMPLOYMENT AND LABOR FORCE RESERVES ON SOUTHEASTERN SOUTH DAKOTA FARMS

BY

DONALD J. BIGGAR

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This thesis is approved as a creditable and independent investigation by a candidate for the degree, Master of Science, and is acceptable as meeting the thesis requirements for this degree, but without implying that the conclusions reached by the candidate are necessarily the conclusions of the major department.

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The basic information relating to farm enterprises, crop acres, farm size, available labor and other data was obtained from the survey schedules taken in Economic Areas 3B and 4B as a part of Research Project No. 393 (Hatch) of the South Dakota Agricultural Experiment Station. (Dr. Wolfgang M. Schultz is the Project leader. This project was designed as a contribution to the North Central Region Project No. NC-54.)

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CHAPTER I

INTRODUCTION

Purpose of the Study

The increasing productivity per farm worker resulting from technological advances in agriculture suggests the problem to be examined: the extent of underutilization of South Dakota farm family labor resources and the implications arising from this situation.

Changes in the agribusiness structure of rural areas and the consequences of the prevailing population movement away from farms and rural communities will be examined in relation to likely future trends. Feasible alternatives for farm operators and for community development planning groups will be discussed.

Present and proposed national agricultural policies will be examined as they apply to the problem and as they are likely to influence alternatives. However, no attempt will be made to suggest national policy solutions for the farm problem.

Discussion of the Problem

In a broad sense, underemployment exists to the degree that labor resources are not efficiently employed. T. W. Schultz has defined efficient employment of farm labor resources in this manner:

> The labor resources of a farm family are deemed to be employed efficiently when the rewards for their efforts are equal to rewards for comparable human efforts in other occupations in the economy. Rewards in this context are in real

> terms in contrast to monetary rewards and include the value that members of the farm family place on leisure, working close to nature, "independence" and other non-monetary values ascribed by them to farming.[1]

The declining importance of the traditional rural trading and social centers is only partially attributable to migration out of agriculture. Increased mobility and improved communications have contributed to multiplying the farmers' choice of commodity markets, and has given the family access to a greater diversity of recreational and educational opportunities and personal consumption goods than ever before.

According to Schultz, the migration rate away from farming will be determined by (1) the rate at which capital is substituted for labor in agriculture; (2) the rate of growth in the demand for farm products; (3) the rate at which farmers reduce their working hours; and (4) the rate of natural increase in farm population.[2]

The Research and Policy Committee of the Committee for Economic Development would accelerate the migration rate out of agriculture as a major policy goal. The Committee report lists the following conditions as causing the farm problem:

> 1. Total Productivity has been growing very rapidly in agriculture. ...
>
> 2. It has become efficient to use less labor, and more capital, in farming. ... While total resources used in agriculture per unit of agricultural output declined 20 percent from 1950 to 1960, farm labor used per unit of output declined

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[1]Theodore W. Schultz, Production and Welfare of Agriculture, p. 106, The Macmillan Company, New York, 1950.

[2]Ibid. p. 33.

45 percent. (The use of nonfarm labor--and capital--as an adjunct of farm production also rose sharply. An instance is the use of industrially produced fertilizers and other chemicals.) It would have been even more efficient to have used still less farm labor. ...

3. The total demand for agricultural products has grown slowly, and this is typical. ...

4. A relatively large decline in prices of our farm products brings about only a small increase in consumption of them. ...

5. Resources, most importantly labor, do not flow freely out of agriculture at the rate necessary to avoid falling incomes.

The point here is not primarily that resources flow out of agriculture less easily than out of other industries, although this is probably true, but that the outflow of resources required from agriculture has been extraordinarily large relative to the resources engaged.[3]

Migration away from farming in South Dakota, the increased size of the remaining farms, and the higher capital investment in efficient and specialized equipment have meant less business for the small town merchants. Changing patterns of goods and services required by farmers, and improved transportation, have brought more business activity, and consequently more population to the larger urban centers.

In an analysis of South Dakota population trends for the period from 1950 to 1960, Marvin Riley found that the total

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[3]"An Adaptive Program for Agriculture," Statement on National Policy by the Research and Policy Committee of the Committee for Economic Development, pp. 15-18, 711 Fifth Avenue, New York 22, New York, July 1962.

population of South Dakota increased 4.3 percent. However, the rural population decreased 5.2 percent, while the urban (i.e., incorporated places with 2500 or more inhabitants) population increased 23.3 percent. Despite the fact that during this decade, South Dakota showed a moderate increase in the total population, there was a net out-migration from the state of 14.4 percent of the 1950 population. In the previous decade, 1940 to 1950, the total population increase was 1.5 percent, with a loss of 10.1 percent from the rural sector and an increase of 23.3 percent to the urban places. In terms of net out-migration, however, South Dakota lost 12.3 percent of her potential population during that period.[4]

The median income of all South Dakota families (in terms of 1959 dollars, for comparability) increased by 25 percent -- from $3,411 in 1949 to $4,251 in 1959. This compares with a 50 percent increase for the United States -- from $3,774 in 1949 to $5,660 in 1959.[5]

The points raised above indicate that the changing structure in agriculture has also had an important effect on other sectors of

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[4]Marvin P. Riley, and Jeanne Biggar, South Dakota Population 1950-1960, Department of Rural Sociology Pamphlet No. 121, pp. 4 and 29, Agricultural Experiment Station, South Dakota State College, Brookings, South Dakota, October 1960.

[5]Median Family Income and Related Data, by Counties, Including Rural Farm Income, Statistical Bulletin No. 339, pp. 68 and 85, United States Department of Agriculture, Resource Development Economics Division, Economics Research Service, Washington, D. C., February 1964.

of population in the area. Individuals and local institutions in the smaller rural communities appear to be most unfavorably affected by the out-migration trend, although the national economy may receive a net gain in terms of more efficient allocation of resources.

In reference to the technological revolution in agriculture during the post World War II period, Fiemup and Berg have said:

"Whenever an industry shifts factors of production to this extent in such a short period of time, the adjustments needed among individual people and communities are large."[6]

The present relatively high rate of off-farm migration appears to be part of a general increase in mobility of the entire population. Sjaastad suggests that this increased mobility has tended to reduce the variation of relative per capita personal income between states since 1930. The key variable in the rate of out-movement from agriculture is the unemployment rate in the total labor force.[7]

The increase in mobility of the population is also seen in an increase in the numbers of workers and distances commuted between home and work. In a recent study, Russell Adams found a general

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[6]Darrell F. Fiemup and Sherwood O. Berg. "Development Programs for Rural Areas." Paper presented at the National Agricultural Policy Forum, sponsored by the Board of Trade of the City of Chicago, December 12, 1962. Mimeo.

[7]Larry A. Sjaastad, "Trends in Occupational Structure and Migration Patterns in the United States with Special Reference to Agriculture." Presented at Conference on Labor Mobility and Population in Agriculture, Iowa State University, Ames. Nov. 8-10, 1960. p. 8.

increase in commuting, and distances commuted. A commuting range of 30 miles between home and work is not uncommon. He expects that 50 miles will be within an acceptable distance in the future.[8]

Objectives

The objectives of this study are to examine the following conditions:

1. The level of effective utilization of farm family labor resources in Southeastern South Dakota.

2. The equilibrium level of farm numbers in the region under specified assumptions of varying levels of specialization and mechanization.

3. The potential movement out of agriculture in the region under conditions of increasing levels of efficiency; and the effects of population losses on rural nonfarm communities.

4. The influence of labor inputs, and farm size in acres, upon gross farm profit.

5. Alternatives for farm families to supplement and/or increase farm incomes.

6. Alternatives for rural communities to retain population and/or adjust to prevailing trends.

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[8]Russell B. Adams. Population Mobility in the Upper Midwest. pp. 42-51. Urban Report No. 6, Upper Midwest Economic Study, University of Minnesota, Minneapolis, Minn. May, 1964.

7. Available farm family labor resources, not utilized in agriculture, as a potential productive resource for local and regional industrial development programs.

CHAPTER II

REVIEW OF LITERATURE

Agricultural programs and policies in the United States appear in many cases to be in conflict with their stated objectives. T. W. Schultz, in Production and Welfare of Agriculture, discusses the economic implications of American agricultural policies and program objectives. He sees two distinct policy objectives: those pertaining to agricultural production and those pertaining to agricultural welfare. Policy has been a mixture of the two objectives, and there has been failure to distinguish between them.[1]

The Committee for Economic Development appears to have proposed the most extensive program for encouraging a reduction in workers in agriculture of any literature reviewed. A five year program was recommended with the goal of approximately a one-third reduction in the farm labor force. Policies would encourage a high level of employment in the general economy, improved education of young people to provide skills needed in the general economy, and labor mobility increased through improved job information services, retraining programs for low income farmers and through loans to cover the cost of moving. A price support program for basic commodities, a cropland adjustment program with incentives to divert cropland to grassland, and a temporary soil bank program to retire whole farms would cushion the

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[1]Schultz. op. cit.

adjustment process during this transition period.[2]

Howard Ottoson has discussed the impact of the reduction of farm population on rural communities. Direct losses to rural trading centers include reduced purchases of food, work clothing, and small appliances, and some decline in purchases of production factors such as fuel and machinery. There is evidence that farmers tend to travel to the larger trading centers for recreation, education, medical services and luxuries. Utilities experience direct loss of revenue. Per capita costs of services with high fixed costs such as consumption electricity, education, roads, county government and utilities will rise.[3]

Ottoson also proposes more analysis and planning at the national and state level. There are many unanswered questions regarding the possibility of generating new economic activity in the small town. If the decline of these places is inevitable, they may be able to plan realistic adjustments.[4]

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[2] "An Adaptive Program for Agriculture," op. cit.

[3] Howard W. Ottoson, Lessening Impacts of Land Withdrawals on Nonfarm Resources and on Rural Communities, Mimeographed material, University of Nebraska, Lincoln, Nebraska.

[4] Howard W. Ottoson, "Viewing the Community Impacts on Regional Development," Paper presented at Workshop of Area Development, Stillwater, Oklahoma, May 8-9, 1963.

Riley's study of population movement in South Dakota shows the growth of urban centers and losses from rural areas.[5]

In another publication, Riley has summarized South Dakota population data and trends from the Census of Agriculture and the Census of Population. He has ranked South Dakota counties by a number of characteristics, and by the rate of change in several characteristics.[6]

Agriculture and Economic Growth delineates the report of a study of the importance of a productive agriculture to economic growth and development. Economic growth requires a balance between industrial and agricultural growth. This is pointed up by examining the relationship between agricultural and economic growth in the United States.[7]

Output per farm worker and gross income per farm worker has shown a steady gain ever since about 1850. This has been the result of growing investments in farm implements and machinery, and production factors such as fertilizer. In addition to the industrial

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[5] Riley, op. cit.

[6] Marvin P. Riley, South Dakota Population and Farm Census Facts, Circular 151, Rural Sociology Department, Division of Agriculture, South Dakota State College, Brookings, South Dakota, January 1962.

[7] James P. Cavin, et al., Agriculture and Economic Growth, Agricultural Economic Report No. 28, Economic Research Service, U. S. Department of Agriculture, Washington 25, D. C., March 1963.

activity generated by the growing purchases of agriculture, capital earned in agriculture has been released for direct investments in industry. In 1900 agriculture accounted for 23.2 percent of the Gross National Product, and in 1960 it accounted for 4.9 percent. The percentage of the labor force employed in agriculture was 37.5 percent in 1900 compared to 8.6 percent in 1960. The productivity per man hour in agriculture has increased more rapidly than that of industrial labor since 1937. Productivity per man hour in agriculture increased 51.0 percent from 1937 to 1948 and 64.7 percent from 1948 to 1957. The 1961 output per man hour is 165 percent higher than it was in 1935.[8]

The report identifies these seven specific ways that American agriculture has contributed to United States economic growth:

> (1) Release of workers to industry; (2) lowering of food costs relative to income; (3) increased purchases of industrial goods; (4) continued export earnings; (5) sustained output during economic depression; (6) the response to wartime needs; and (7) assistance to world economic development.[9]

Ruttan and Callahan have summarized the present and expected situation of agriculture:

> Current population and per capita income projections imply a growth in the demand for farm products of slightly more than 30 percent between 1960 and 1975. If technological change continues at the level maintained during the decade of the 1950's, it seems likely that the 1975 farm output will be produced with approximately 25-30 percent less labor, around 10-15 percent more capital, a 25-30 percent increase in current

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[8] Ibid.

[9] Ibid., p. 20.

operating expenses, and a decline in land inputs of 5-10 percent. Furthermore, these output and input changes are expected to occur with no rise in farm prices relative to the general price level.

It seems clear then that in the case of agriculture, resource scarcity cannot be expected to act as a serious brake on the growth of output during at least the next decade and a half. The momentum of the current technical revolution is such that it is reasonable to expect the production of 1975 farm output requirements with little or no rise in total inputs and with less land than at present.[10]

The Upper Midwest Economic Studies series provides valuable background and statistical information. Knudtson and Cox conclude that the majority of farms have two basic problems: (1) low income; and (2) underutilization of labor. Probably two-thirds of all Upper Midwest farms do not provide adequate returns for the labor and capital invested. The possibilities for developing off-farm work are limited, and if the problem is to be solved, large numbers of farmers will need to migrate to metropolitan areas.[11]

Larry Sjaastad's population study shows that the Upper Midwest is now predominantly urban for the first time. Substantial reductions in the numbers of farms has intensified the trend to migration out of the area in the past thirty years. This movement is likely to

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[10] V. W. Ruttan, and J. C. Callahan, "Resource Inputs and Growth: Comparisons between Agriculture and Forestry," Forest Science, pp. 68-82, March 1962.

[11] Arvid C. Knudtson, and Rex W. Cox, Upper Midwest Agriculture: Structure and Problems, Study Paper No. 3, Upper Midwest Economic Study, University of Minnesota, Minneapolis 14, Minnesota, January 1962.

continue, but at a decreasing rate as the farm population declines.[12]

Rodd and Henderson analyzed nonagricultural employment and earnings growth in the Upper Midwest between 1950 and 1960. Nonfarm employment in the United States increased by 18 percent during this decade. With the exception of the Minneapolis-St. Paul metropolitan area, the areas in the Upper Midwest did not reach this percentage. Nonagricultural employment in South Dakota increased 16 percent from 1950 to 1960. Wages and salary earnings per employee in 1960 were $4,764 for the nation as a whole. Average earnings in Minnesota were $4,657, North Dakota, $4,026, and South Dakota, $3,798. The below average earnings in South Dakota are partially explained because relatively more employment was in trade, services, and state and local government.[13]

Learn, et. al., studied the agricultural income problems. They defined basically two income problems: an excess-capacity problem that is a result of production in excess of market demands at prevailing prices and an income-resource problem that is a

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[12]Larry A. Sjaastad, Migration and Population Growth in the Upper Midwest: 1930-1960. Study Paper No. 4, Upper Midwest Economic Study, University of Minnesota, Minneapolis 14, Minnesota, July, 1962.

[13]R. Stephen Rodd and James N. Henderson, Employment and Earnings in the Upper Midwest: 1950-1960. Study Paper No. 5, Upper Midwest Economic Study, University of Minnesota, Minneapolis 14, Minnesota, December 1962.

result of inadequate resources on individual farm units. Although the problems are related they stem from different causes and require different solutions. The excess-capacity problem requires national policy measures, while the income-resource problem requires individual actions and local and regional group decisions. There are three general alternatives open to low income farmers. They can (1) continue on the present arrangement, (2) increase income by expanding operations or supplement their farm income with nonfarm work, or (3) leave the farm in favor of full time employment in other industries.[14]

Policies and programs to encourage migration away from agriculture may create new problems while providing partial solutions for present problems. Bishop believes that the rate of migration assumed in the Committee for Economic Development proposal would have serious implications for the entire national economy and disrupt the agribusiness sector of the economy. More than two-thirds of farm operators with less than $10,000 gross income from farm production are over 45 years old and have few or no realistic alternatives to farming. A reduction in the number of low income farms and recombination into larger units may actually increase total farm output and cause a reduction in aggregate farm income.[15]

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[14]Elmer W. Learn, Rex W. Cox and Richard J. Herder, Upper Midwest Agriculture: Alternatives for the Future. p. iii, Study Paper No. 6, Upper Midwest Economic Study, University of Minnesota, Minneapolis 14, Minnesota. December 1962.

[15]C. E. Bishop, "The CED Program for Agriculture." Agricultural Policy Review. 2:2/62. pp. 3, 16. Agricultural Policy Institute, North Carolina State College, Raleigh, N.C.

Although a number of operators quitting farming do so involuntarily, Guither found that in Illinois between 1960 and 1961, 75 percent of those leaving the farm did so voluntarily. The most common reason given by those who left voluntarily was the expectation of better opportunities off the farm. Of those forced off the farm, the most common reasons given were in this order: (1) health failure, (2) lack of income to meet family needs, (3) termination of lease, (4) sale of farm and (5) credit restrictions and heavy debt. One-third said that rising costs, declining prices, low incomes and financial problems were most important. Two-thirds said this had some influence. Financial problems were most frequently reported in younger age groups. Nineteen percent left mostly because of tenure problems. About one-fourth of those leaving were age 65 or over. Ten percent left before retirement age because of health problems and about one-tenth had family or other sociological problems.[16]

The efficient family-type farm does not appear to be in danger of disappearing. According to Helfinstine there is a trend to larger size and greater specialization in agriculture. Most of the production economies of specialization are reached at a level attainable on the family farm.[17]

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[16] Harold D. Guither, "Factors Influencing Farm Operators' Decisions to Leave Farming." Journal of Farm Economics, 45:3 pp. 567-576. August 1963.

[17] Rex Helfinstine, "The Role of Specialization in Modern Farming." South Dakota Economics Newsletter. Extension Service, U.S.D.A. South Dakota State College, Brookings, S.D. October 16, 1962.

CHAPTER III

PROCEDURE

The Geographic Area Studied

This study will be primarily concerned with the seventeen counties in Economic Area 3B and Area 4B.[1] These two economic areas will subsequently be referred to as Southeastern South Dakota.

Southeastern South Dakota includes thirteen percent of the land area of the state, and in 1960 contained nearly 36 percent of the population. This is the most urbanized section of South Dakota, and includes the metropolitan area of Sioux Falls. The western boundary is an arbitrary one, separating the area under study from the drier counties of the transition area and the rolling country along the Missouri River. The south boundary is formed by the Missouri River, including the Lewis and Clark Reservoir. The Fort Randall Dam and a part of the Fort Randall Reservoir are on the boundary of Charles Mix County. The section is bounded on the east by the borders of northwestern Iowa and southwestern Minnesota. The extreme southeast tip, in Union County includes North Sioux City, which is considered a part of the Sioux City, Iowa metropolitan area.

Area 3B, sometimes called the South James River area, is in the western fringe of the Corn Belt region. Hogs, cattle feeding, dairying

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[1] These areas have been designated as "economic areas" by the Bureau of the Census, and "general type of farming areas" by the B.A.E.

SOUTH DAKOTA

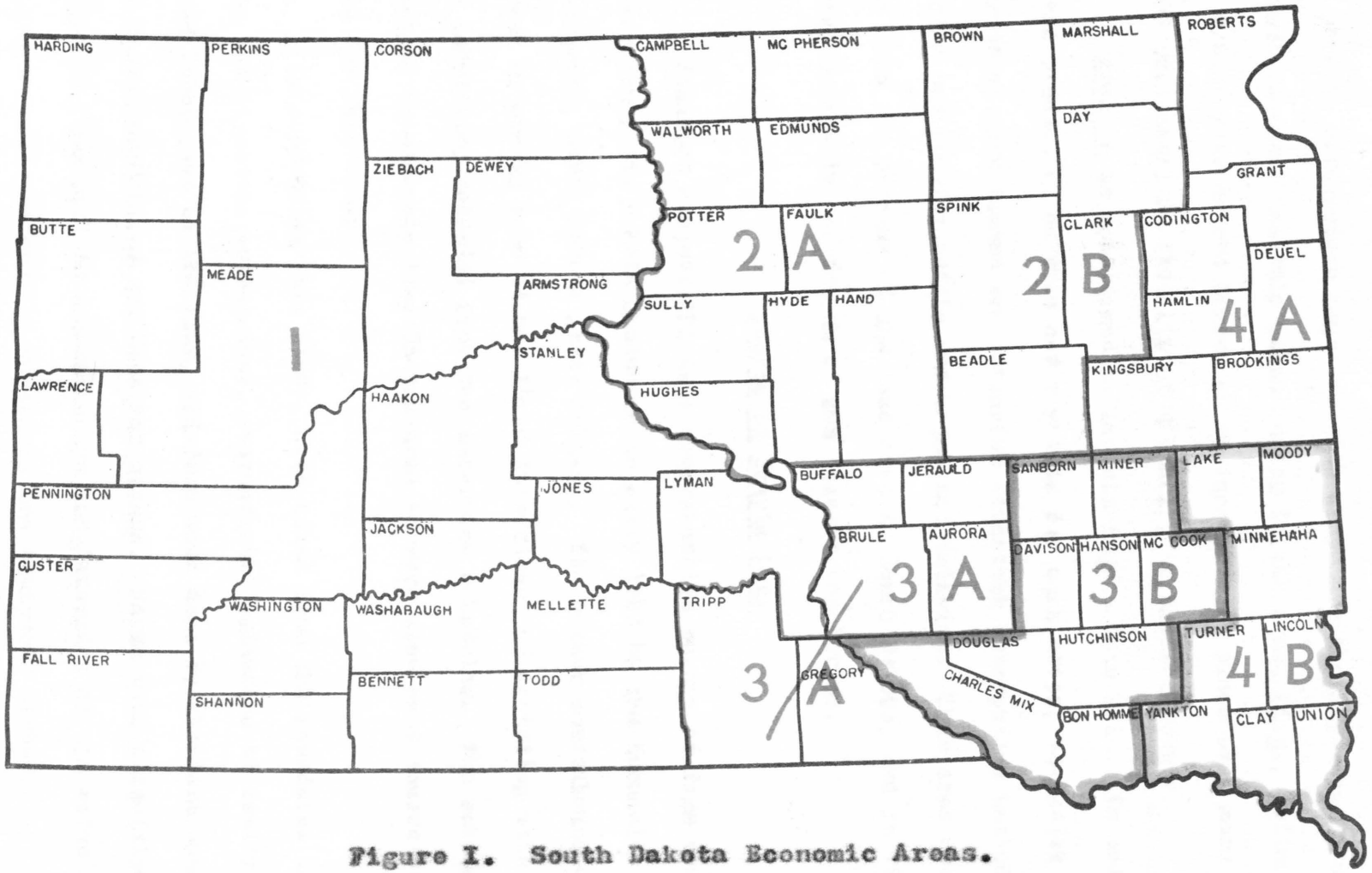

Figure I. South Dakota Economic Areas.

and poultry enterprises together with crops are the important sources of farm income. The only urban center in the area, (i.e., defined by the U.S. Bureau of the Census as an incorporated place with more than 2,500 residents) is the city of Mitchell, in Davison County.

Area 4B is considered to lie within the Corn Belt. In addition to the production of corn and soybeans for cash crops, the major sources of farm income are intensive livestock enterprises including raising and feeding cattle and hogs, and dairying. This area covers less than six percent of the land area in South Dakota, and in 1960 contained nearly one-fourth of the state's population.

Source of Sample Data

Research Project 393 is a comprehensive survey of farm resources in eastern South Dakota conducted in early 1963 by the Economics Department, South Dakota State College. The author contributed to the survey by making some of the field interviews and assisting with coding and tabulating material from the interview schedules. The schedules obtained in economic Area 3B and Area 4B were used as a source of data for this study.

In conducting this study, data taken from the schedules included crop and livestock enterprises, respondents' estimates of family and hired labor used on the farm, off-farm work done by the farm operator and custom work hired and done for others. Farms were classified as "high" or "average" in mechanization and intensity of operation by the practices followed and the machinery and equipment listed.

The sample was a 1.8 percent fraction of all operating units, 50 acres and larger[2] drawn in the two areas. A three stage sampling procedure was used. Five of the nine counties in Area 3B and four of the eight counties in Area 4B were first selected as the primary sampling units (psu). A number of representative townships (ssu) were selected from each psu and all farms in the ssu were listed. A complete list of all farms (listing units) was obtained from the Agricultural Stabilization and Conservation Offices[3] in each county. The listing units were placed in an array by size of farm, and every kth unit systematically drawn for the elementary sampling units. This procedure provided an equiproportionate sample.

From 161 units drawn for Area 3B, 157 schedules were accepted and 174 schedules were accepted out of 184 units drawn for Area 4B. This gave a final sampling fraction of slightly less than 1.8 percent of the 1959 number of farms. Based on projected numbers of farms for 1962, the sampling fraction was slightly higher than 1.8 percent. (See Table 3.)

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[2]U.S. Bureau of the Census. U. S. Census of Agriculture: 1959. Vol. I, Counties, Part 19, South Dakota. pp. 124-129. U. S. Government Printing Office, Washington D. C. 1961.

[3]This list had been obtained by Ervin Ullrich, Economic Research Service, United States Department of Agriculture, for a related study.

Labor Available on Sample Farms

Available Labor as it will be used in following sections of this paper, is measured in Man-work Units (MWU). A MWU is defined as a normal ten hour working day in farming by an adult worker at average efficiency.[4] The work accomplished during the day is considered to include all overhead labor required on the farm, including marketing, purchasing supplies, keeping records and attending to correspondence, as well as time spent at meetings or otherwise obtaining information for future farm management decisions.

Labor Available on family farms as used here includes the number of days worked by hired help, family members, and hired custom operations as well as the operator's own labor.

During the interview, operators were asked to estimate the average number of hours they worked weekly, and the maximum number of hours during rush periods. They were asked for an estimate of the hours worked per week on the farm by family members. It is likely that overhead labor items performed by family members was underestimated, because it is considered probable that many farmers do not look at many of these related tasks as "work".

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[4] In comparing this with eight hour working day customary in a number of other industries; the farmer does not have commuting time to and from his job, nor the preparation and cleanup time which is often in addition to regular working hours in a number of other industries. A six day workweek in farming is assumed here, in contrast to a five or five and a half day week in many other employments.

For the purposes of this study, operator labor was listed at 300 MWU annually, minus the number of days reported as worked off the farm. Full time hired labor was also tabulated at 300 MWU for the year. If the operator indicated that his ability to work was impaired by poor health, or was 61 years old or over or worked off the farm more than 100 days during the previous year, he was considered to be semi-retired, or a part-time operator. In that case, the amount of available labor credited to the operator was equal to the MWU required on the farm, minus family and hired labor used. As the result of this classification, part-time or semi-retirement farms were not shown in later analysis to be either overemployed or underemployed.

The man-work units of labor performed by family members was adjusted to reflect age and sex differentials after the estimated hours worked weekly had been calculated in proportion to the standard six day workweek. (Table 1).

Table 1. Adjustments for Age and Sex of Family Workers.

Men and Boys		Women and Girls	
Age	Weighing Factor	Age	Weighing Factor
11 or less	.4		
12 to 13	.5	14 or less	.4
14 to 16	.6	15 to 16	.5
17 to 18	.8	17 to 18	.6
19 to 62	1.0	19 to 20	.7
63 to 65	.8	21 or older	.8
66 to 69	.7		
70 or older	.6		

Labor Requirements for S.E.S.D. Farms

The tables of labor requirements for farm enterprises used in this study[5] were compiled from a number of other sources and adapted to Southeastern South Dakota conditions.[6] These requirements assume reasonably efficient work methods. Requirements per head of livestock were scaled by size of herd assuming that economies of scale and better utilization of equipment would result in labor efficiency.

Although some provision was allowed for differentials between average and above average size and efficiency of machinery and equipment, it is not uncommon to observe farms with equipment well above or below the levels in these standards. To some degree, compensation is introduced to overcome these discrepancies by lower per acre overhead labor requirements for the larger farms, and the converse for smaller units. It is also possible that some farms are not large enough to realize the full efficiency of the machinery and equipment being used.

A few respondents reported work methods and equipment which are considered relatively inefficient and obsolete. Examples of this are the use of converted horse-drawn machinery, or milking cows by hand. Although farmers who are working with inadequate or inefficient equipment

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[5] See Appendix Tables A1 through A5.

[6] See Bibliography for list of sources. Most of the basic studies of labor requirements were made at different times, and reflect conditions and practices in other states. Adaptations on the basis of judgements were made. Other available tables have been compiled in much the same manner and modified to fit the conditions for which they had been derived.

and using inordinate amounts of hand labor properly consider themselves as working full time, this type of situation was disregarded in determining labor requirements. It appears that nearly any alternative to this level of labor utilization would provide a higher return to labor.

The farms in the sample were classified as either full-time or part-time farms. Full-time farms are defined as farms with the operator not over 60 years of age, in apparent good health, and who did not work off the farm more than 99 days in 1962. All farms not meeting these standards were classed as part-time or semi-retirement farms.

Assumed Levels of Labor Efficiency

Labor requirements were computed for each farm for the following assumptions of levels of labor efficiency.

1. Assumption A: The levels of efficiency, specialization and mechanization that were recorded on the interview schedules. Total labor requirements were obtained by multiplying the applicable factors from Tables A1 and A2 by the number of units in each enterprise, then adding the indicated overhead labor requirement from Table A1.

2. Assumption B.: With minimum levels of mechanization and specialization for crop and livestock enterprises moderately higher than the levels actually reported by the operators. Labor requirements for full-time farms in the sample were calculated as above, using the same numbers of units in each enterprise, but the lower figure of the requirements per unit which would apply from either Table A1, A2,

or A3. Cropping practices in Area 4B were all classed as "intensive", reflecting the typical crop production methods in the area. The minimum levels of specialization assumed in Table A3 are at the general level where economies of scale begin to become effective, yet are not so high that this level cannot be reached on most farms without increasing capital investments in buildings and equipment.

3. Assumption C: That specialization is the same as the levels used for Assumption B, and that all farms in the area are at least as large as the average size of farm in acres at present. Overhead labor requirements for farms smaller than 390 acres in Area 3B and 305 acres in Area 4B were changed according to the per acre requirements given in Table A4.

Labor Used for Custom Work

Custom or machine work man-labor requirements were calculated from the MWU requirements given in Table A5. Custom work hired was included under available labor, in the same sense as hired labor, and custom work done for others was counted as another farm enterprise, and included with the total labor required for the farm. Most farmers interviewed appeared to consider a small amount of custom work as a normal part of their farming operation, in the same nature as exchanging work with neighbors.

Underemployed Farm Labor Resources on Sample Farms

The amount of underemployment (nonutilized labor) on the farms sampled was determined by subtracting the number of man-work units required from the MWU available for each farm having less MWU required than labor available.

The term labor potential will be used when referring to nonutilized labor in agriculture as a potential labor resource for industrial development plans. The total potential labor from the sample is the sum of the nonutilized MWU, as determined above, arbitrarily excluding all sample units having less than thirty man-work units not employed in farming.

1962 Farm Number Projections for S.E.S.D.

Estimated 1962 farm numbers were deemed preferable to unadjusted figures from the 1959 Census of Agriculture for use in deriving parameter estimates by statistical inferences. The rate of change selected for these projections was the 1954-1959 rate of change for a comparable number of years.

Census of Agriculture data indicate that the number of farms in Southeastern South Dakota has been decreasing at an increasing rate for the last three Census periods (Table A6). In the 1945-1950 period the number of farms in the area decreased 1.6 percent. The rate of reduction was 2.9 percent from 1950 to 1954 and 8.7 percent during the 1954-1959 period. This is a lower rate of decrease than the rate for

the entire state. South Dakota farm losses for the same periods were 3.3 percent, 6.0 percent and 10.9 percent. The percentage change in number of farms 50 acres and larger was approximately the same as for all farms in all counties. The ratio between the number of all farms and the number of farms 50 acres and larger has remained almost constant in each Census of Agriculture report since 1945 (Table A7).

According to Learn, the rate of reduction in farm numbers for the 1959-1975 period is expected to be lower than actually occurred during the 1949-1959 period.[7]

The percentage change in farm numbers during the period 1954-1959 was computed for each county in Southeastern South Dakota, (See Table A8). This rate multiplied by the number of farms in 1959 times .6 gave the estimated reduction in number of farms from 1959 to 1962, (Table A13).

The amount of land in farms for each county was estimated in the same manner, (Table A9). The average farm size was then obtained by dividing the number of farms into the land in farms.

The number of farms 50 acres and over was estimated by multiplying the projected number of all farms by the percentage ratio between the two in 1959.

In Table 2, following page, the average size of all farms and farms over 50 acres for 1959 and 1962 are shown in relation to the average size in acres for the farms sampled in each psu and each area.

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[7]Learn, et. al., op.cit. pp. 46, 64.

Table 2. Average Acres per Farm for Sample Farms, Commercial Farms, All Farms and Farms 50 Acres and Larger, 1959 and 1962.

	1959			1962		
	Com'l[a] Farms	All[b] Farms	Over[c] 50 A.	Sample Farms	All Farms	Over 50 A.
S.E.S.D. (All)	320.0	300.1	319.3		315.4	335.7
Sample Counties	346.8	326.3	299.8	322.2	296.5	319.7
Area 3B (All)	386.8	363.7	381.3		381.8	399.9
Sample Counties	346.8	326.3	344.1	364.1	343.5	366.8
Bon Homme	290.5	276.5	294.3	315.0	284.4	302.7
Davison	396.3	360.7	382.7	435.0	394.9	407.4
Douglas	374.9	346.7	368.5	377.5	363.2	389.5
McCook	307.8	296.2	311.1	314.3	308.1	327.1
Miner	417.9	391.7	404.2	471.4	420.8	435.3
Area 4B (All)	263.5	246.1	265.1		258.9	279.3
Sample Counties	255.5	241.5	258.7	284.3	255.0	275.5
Clay	267.0	252.8	276.3	293.9	273.8	298.0
Lincoln	233.4	221.6	238.2	260.1	228.2	248.5
Moody	293.8	273.1	288.2	310.3	289.5	304.9
Turner	243.6	231.4	246.9	282.0	245.6	260.0

[a] U.S. Census of Agriculture: 1959. pp. 134-139.

[b] Ibid. pp 112-117.

[c] Ibid. pp 124-129.

Table 3 shows the estimated percentage of the total number of farms in the sample. These figures will be used for deriving estimates from sample data for all farms in Southeastern South Dakota.

Table 3. Sampling Fractions by Size of Farm, 1962.

	No. in Sample	All Farms	f*	Over 50 A.	f
S. E. S. D.	331	19,455	1.70	17,996	1.84
Area 3B	157	8,950	1.75	8,404	1.87
Bon Homme	40	1,229	3.25	1,136	3.52
Davison	23	692	3.32	608	3.78
Douglas	28	793	3.53	746	3.75
McCook	37	1,183	3.13	1,123	3.29
Miner	29	822	3.53	794	3.65
Area 4B	174	10,505	1.66	9,591	1.81
Clay	32	901	3.55	809	3.96
Lincoln	52	1,539	3.38	1,437	3.62
Moody	41	1,126	3.64	1,052	3.90
Turner	49	1,563	3.13	1,421	3.45

*Percent of all farms in sample (Sampling Fraction).

Labor Inputs, Farm Size and Gross Farm Profit

It appears to be a continuing trend in farming that farms are growing larger, measured both in number of acres operated per farm and in volume of business. In support of the assumption that the marginal return for additional productive inputs of land and labor may offer an incentive to farm operators to expand present farm enterprises, the functional relationships between gross farm profit[8] and land and labor inputs were analyzed statistically.

Regression analysis provided estimates of the functional relationships between gross farm profit and labor required, labor required and size of farm in acres, and gross farm profit with acres operated. The degree of covariance was tested by correlation analysis.

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[8] Gross farm profit is total farm income less the cost of purchased livestock and inventory changes. This figure may be considered a measurement of turnover, or volume of business. The ratio of gross farm profit to net farm income varies by type of operation. The net farm income would be obtained by subtracting fixed and variable costs.

CHAPTER IV

FINDINGS

Farm Labor Resources and Utilization

Average labor resources available on the sample farms, from hired workers, family members, and for the operator[1] are shown in Table 4, below. The number of days worked off the farm by the operator are not included with the labor available.

Table 4. Average Man-work Units Available per Farm.

	No. in Sample	MWU Hired	MWU Operator	MWU Family	Total
S.E.S.D.	331	25.2	274.6	44.2	344.1
Area 3B	157	20.8	278.9	41.7	341.4
Bon Homme	40	19.7	279.0	40.6	339.5
Davison	23	24.7	270.7	46.4	341.7
Douglas	28	6.7	302.9	39.0	351.0
McCook	37	11.9	275.7	39.8	327.4
Miner	29	43.7	266.3	34.8	354.7
Area 4B	174	29.3	270.8	46.4	346.5
Clay	32	8.9	275.1	29.7	313.7
Lincoln	52	27.8	279.0	55.6	362.4
Moody	41	45.1	276.4	44.6	365.9
Turner	49	31.2	254.6	49.1	334.9

[1] In the "MWU Operator" column for Douglas County the average operator labor available is higher than 300 man-work units because of the presence of partnerships in the sample. Available labor for all partners jointly managing and operating farms was tabulated in this category.

Average labor requirements for all farms and full-time farms of the sampled units are tabulated below by counties (Table 5). The average number of days worked off the farm is also shown.

Table 5. Average Man-work Units Required per Farm, and Days Worked Off the Farm, for All Farms and for Full-time Farms.

	All Farms			Full-time Farms		
	$\bar{n}$	MWU Required	Days Off-Farm Work	$\bar{n}$	MWU Required	Days Off-Farm Work
S. E. S. D.	331	303.7	17.9	271	336.1	6.4
Area 3B	157	316.7	20.7	133	343.7	7.6
Bon Homme	40	315.6	14.5	33	344.4	6.9
Davison	23	306.1	36.0	19	342.7	10.9
Douglas	28	359.3	16.1	28	359.3	16.1
McCook	37	298.9	18.1	30	327.6	1.6
Miner	29	308.0	25.1	23	346.2	3.2
Area 4B	174	292.1	15.4	138	328.7	5.3
Clay	32	241.8	26.1	24	285.3	7.7
Lincoln	52	301.9	17.0	43	323.5	4.0
Moody	41	303.7	11.5	35	330.4	5.9
Turner	49	304.9	10.0	36	362.2	4.7

The average nonutilized labor, and the average potential labor supply for the farms of the sample are shown in Tables 6 and 7. These estimates are given for assumed levels of efficiency described in Chapter III.

Table 6. Average Man-work Units per Farm Not Utilized,* by Assumed Levels of Labor Efficiency.

	Man-work Units for Assumption:		
	A**	B**	C**
S. E. S. D.	56.7	88.0	91.4
Area 3B	45.6	77.0	80.2
Bon Homme	42.6	73.6	78.6
Davison	74.2	100.3	103.1
Douglas	24.3	56.5	60.1
McCook	37.1	72.0	74.2
Miner	58.2	89.2	91.3
Area 4B	66.7	98.0	101.4
Clay	86.6	105.8	109.2
Lincoln	69.2	111.4	115.7
Moody	76.4	107.6	110.2
Turner	43.0	70.5	74.0

Table 7. Average Labor Potential* per Farm, by Assumed Levels of Labor Efficiency.

	Man-work Units for Assumptions:		
	A**	B**	C**
S. E. S. D.	55.7	87.0	90.5
Area 3B	44.1	75.9	79.1
Bon Homme	40.2	73.1	78.0
Davison	72.8	100.2	103.1
Douglas	23.9	53.8	57.3
McCook	35.6	71.2	73.3
Miner	59.4	88.0	90.2
Area 4B	66.2	97.0	100.7
Clay	86.6	104.7	108.1
Lincoln	68.7	111.2	115.3
Moody	75.7	106.0	109.7
Turner	42.4	69.5	72.8

* Nonutilized Labor and Labor Potential are defined on p 24

** Assumption A, B and C are described on pp 22 and 23.

Nonutilized Labor on Southeastern South Dakota Farms

Estimates of the total nonutilized labor for Southeastern South Dakota are shown in Table 8. Rounded estimates in man-years are given for the three assumed levels of labor efficiency described on pages 22 and 23.

Table 8. Estimated Man-years Nonutilized Labor* On S.E.S.D. Farms, by Specified Assumptions.

	Man-years for Assumption:		
	A	B	C
S. E. S. D.	3,700	5,700	5,900
Area 3B	1,400	2,300	2,400
Area 4B	2,300	3,400	3,500

*$L_u = \frac{l_u \cdot \bar{n}_i}{300 f_i}$ Where L_u is the total nonutilized labor in the population; l_u is the average nonutilized labor in the sample; $\bar{n}_i$ is the number of farms sampled in the area; and f_i is the sampling fraction for the area for "All Farms" (Table 3).

An estimated equilibrium number of farms[2] under the three assumed are compared with an estimate of farm numbers for 1975 (assuming the 1954-1959 rate of change continues), is shown in Table 9. In making these inferences, full labor employment and no innovations in agriculture are assumed.

[2] "Equilibrium number of farms" is the number of farms which would be left if the persons presently underemployed (assuming labor requirements A, B, and C) were to leave.

The three estimates (A, B, and C) of a series of efficiency levels possibly bracket the trend projection estimates. These are shown in this manner as one possible basis to estimate potential off-farm migration. The projected number of farms in 1975 is shown as a basis for comparison.

Table 9. Estimated Equilibrium Number of Farms,* S.E.S.D., by Assumed Levels of Labor Efficiency, and Estimated Number of Farms by 1975 Projected at 1954-59 Rate of Change.

	Assumption: A N_a	B N_a	C N_a	Projected No. Farms 1975
S. E. S. D.	16,200	14,500	14,200	15,600
Area 3B	7,700	7,000	6,800	7,200
Area 4B	8,500	7,500	7,400	8,400

* $N_a = N - \frac{l_u \cdot \bar{n}_i}{l_a \cdot f_i}$ where N_a is the estimated equilibrium number; N is the 1962 number of farms (Table A13).; l_u is the average nonutilized labor in the sample for the Economic area; $\bar{n}_i$ is the number of farms in the sample; l_a is the average MWU available per farm, and f_i is the sampling fraction.

A Potential Labor Source for Nonfarm Employment

Rounded estimates of the total labor supply potentially available for other employment from Southeastern South Dakota are given in Table 10, by Assumptions A, B, and C. These estimates are shown as equivalents of 2500 working hours (man-years) in nonfarm employment.

Table 10. Estimated Labor Potential* on Southeastern South Dakota Farms by Specified Assumptions of Levels of Labor Efficiency.

	Man-Years by Assumption:		
	A L_p	B L_p	C L_p
S. E. S. D.	4,300	6,800	7,100
Area 3B	1,600	2,700	2,900
Bon Homme	190	360	380
Davison	200	280	290
Douglas	70	170	180
McCook	170	340	350
Miner	190	290	300
Area 4B	2,700	4,100	4,200
Clay	310	370	380
Lincoln	420	680	710
Moody	340	480	490
Turner	280	430	460

* $L_p = \frac{l_p \cdot n_i}{250 \quad f_i}$ where L_p is the equivalent man-work years of the labor potential (250 days); and $l_p \cdot n_i$ is the total labor potential in MWU from the sample.

It is likely that this labor potential[3] may not possess the kinds of skills in the ratio needed for proposed development of industry in rural communities. Although many skills are easily transferred to other kinds of jobs, a training program would probably be

[3] The actual number of workers who can be expected to become available for off-farm employment would depend in part upon the wage scale offered. Each increment increase in the wage offered will attract an additional increment of labor. No estimate of the wage scale which would be necessary to attract the maximum potential labor supply is suggested here.

for maximal development of a labor pool for industry. Planning work schedules to fit the seasonal nature of farming is likely to be another factor to be considered.

Labor Inputs, Farm Size and Gross Farm Profit

The results of the correlation and regression analysis of the functional relationships between labor required, farm size in acres, and gross farm profit are presented in Table 11. When gross farm profit was considered as a function of man-work units required, approximately $51.00 was added to gross farm profit for each additional man-work unit utilized on Southeastern South Dakota farms.[4] The square of the coefficient of correlation indicates that almost half ($r^2 = .450$) of the variance in gross farm profit is "explained" by the labor input.

A comparison of farm size in acres in relation to gross farm profit indicates a marginal return to an additional acre of approximately $28.00 in gross farm profit.[5] Size of farm accounted for about one-fourth of the variance in gross farm profit ($r^2 = .261$).

The comparison of labor required as a function of acres operated gives the estimate that about .44 man-work units are required for each acre added.[6] The number of acres operated "explained" almost

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[4] $Y_p = -18.986 + .511\ X_r$ (where Y_p is gross farm profit in one hundred dollar units and X_r is man-work units required.)

[5] $Y_p = 143.3 + .276\ X_a$ (where X_a is in acres).

[6] $Y_r = 180.6 + .442\ X_a$.

two-fifths (r^2 = .388) of the variance in labor required for acres added. The strength of the relationship supports the prior assumption that one motive for the trend to farm enlargement is that this offers a method of increasing the utilization of available labor for individual farms.

Table 11. Coefficients of Regression and Squared Correlation Coefficients for Gross Farm Profit as a Function of Labor Required, Gross Farm Profit as a Function of Acres Operated and Labor Required as a Function of Acres in Farm; Southeastern South Dakota.

	$Y_p = f(X_r)$ [a]		$Y_p = f(X_a)$ [b]		$Y_r = f(X_a)$ [c]	
	b	r^2	b	r^2	b	r^2
S. E. S. D.	.511	.450**	.276	.261**	.442	.388**
Area 3B	.454	.587**	.281	.507**	.467	.490**
Bon Homme	.634	.402*	.281	.368**	.431	.591**
Davison	.111	.684**	.352	.794**	.453	.734**
Douglas	.855	.424**	.193	.269**	.284	.336**
McCook	.663	.180*	.237	.227**	.346	.199*
Miner	.136	.740**	.347	.753**	.548	.752**
Area 4B	.606	.430**	.397	.249**	.448	.271**
Clay	.710	.272**	.530	.327**	1.048	.692**
Lincoln	.676	.305**	.595	.379**	.578	.238**
Moody	.740	.421**	.275	.180*	.562	.578**
Turner	.536	.268**	.273	.150*	.549	.568**

* Significant at the 5% level.
** Significant at the 1% level.

a/ Gross Farm Profit (in $100 units) as a function of MWU Required.
b/ Gross Farm Profit as a function of size of farm in acres.
c/ Man-work Units Required as a function of acres operated.

The variations in regression coefficients and coefficients of determination between counties are probably explained by locational factors such as weather conditions, type of farming, and intensity of operation. The proportion of the variability within the dependent variables suggests that future analysis of these relationships possibly should include other related variables and the interrelationships among the variables.

The findings presented in this chapter support the general hypothesis that a relatively large amount of nonutilized farm labor resources is present in Southeastern South Dakota. Moderate increases in farm size and efficiency will intensify the extent of underemployment in agriculture. The marginal returns to labor and land (Table 11) indicate some incentive for farmers to expand existing farm operations.

Some part of the labor resources[7] not being utilized for farming is expected to become available for other employment. Full utilization of this potential in agriculture will result in the displacement of some present farm workers and/or an increase in total farm production.

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[7] It should be emphasized that the labor potential in the context of this paper is in addition to the natural population surplus on South Dakota farms, i.e., young persons from farms who move directly into nonfarm employment upon reaching working age.

CHAPTER V

IMPLICATIONS FOR FARM AND COMMUNITY ADJUSTMENT

Alternatives for Agriculture

The "farm problem" is not a single, sharply defined problem, but rather the aggregate sum of the problems of the entire agribusiness sector of the American economy. In a market economy, the farm problem becomes manifest as an income problem.

Public policy approaches to the farm problem are in three general areas: (1) policies to expand uses and increase sales of agricultural commodities, (2) programs to reduce production or restrict sales of farm products or (3) direct or indirect assistance to individual farm operators.

General examples of programs to increase the use of farm products are advertising and promotion campaigns to promote specific goods or to raise the general level of nutrition, and research programs to find new uses for agricultural commodities. Market development programs to find new customers for American farm products offer an important potential for the future. Foreign consumption may have the best possibility for expanding markets.

A number of Federal programs designed to restrict production or sales of farm products have been established. Among current programs in this category are acreage restrictions and land retirement programs. Storage programs have been instituted to remove farm commodities from

normal market channels. Certain commodities are subject to marketing orders as a method of restricting sales. Some commodity groups have voluntary restriction programs through quantity or quality controls.

There are a number of forms of direct and indirect assistance to individual farmers and special classes of farmers. Low interest loans are available for a number of specified purposes. Direct subsidy payments are made to encourage adoption of new and improved farm practices or to divert crop land to other uses. Research projects often produce results of direct or indirect benefit to farmers, or to agriculture as a whole. Educational institutions and extension agencies inform individuals and interested groups about applications and uses for research results.

National farm policy often appears to be directed toward retarding the rate of off-farm migration in order to lessen the potentially disruptive effects of increased migration on other sectors of the economy.

It seems to be politically unpopular to suggest any reduction in farm numbers. Individuals and groups voicing objections to policy proposals directed at encouraging mobility of farm labor into other industries often seem to imply that large corporation types of farm organizations are replacing the family farm. Many of these objectors appear to equate the family-type farm with small farms.

Although the efficient family-type farm is larger than in the past, it does not seem to be in danger of disappearing. Most studies

in this respect indicate that efficient family farms are able to compete successfully with large operations depending upon hired managers and workers.

Of the alternatives available to the individual farm operator with inadequate income, it is not uncommon to find that a voluntary or involuntary decsion was made to adjust to his present level of income and make no changes in his operation. Each farmer has his own limits of capability, and expansion efforts may possibly be unsuccessful.

Some operators in the low income and low production class may come closer to attaining security and satisfaction on below average farms than would be possible with limited skills and ability in any other occupation.

Competition for land has had an important influence in the reduction in farm numbers. When a farm management decision is made to expand the operation in order to make more efficient use of labor, management and capital, there are two general alternatives. The farm can be expanded horizontally and more crop and grazing land operated or it may be enlarged by means of expanding more intensive enterprises which do not require additional land.

An additional tract of land may have a higher marginal value to an established operator than to another class of purchaser, because it may often be operated with no additional equipment, and with labor which may be available but not utilized. Many land transfers are for the purpose of enlarging and consolidating existing units. This has the net

result of increasing the average farm size. Since the amount of agricultural land cannot be expanded, it follows that if average farm size increases the number of farms and the farm population must decrease.

In general the decline in farm numbers resulting from competition for land is a voluntary process. The marginal, or less desirable, units become incorporated with other farms when the present operator retires or leaves the farm for other reasons. Farm units in this category are often adequate for older families who may have lower financial requirements, and few realistic alternatives to farming. The same unit will be less attractive to a younger generation of beginning farmers, except possibly as a stepping stone.

Throughout this paper it has been implied that off-farm migration is expected to continue until full employment of farm labor resources has been reached in agriculture. This is, of course, only a working hypothesis. The economic forces which motivate movement into and out of agriculture are generally real or expected diffentials in income and level of living between farming and other occupations, reinforced by social and involuntary considerations. Yet it is safe to assume that farm families will earn below average incomes if their farms do not permit efficient use of their labor and management. The decline in farm numbers will probably stop somewhat short of full parity of personal income between agriculture and other occupations because of noneconomic advantages imputed to living on farms and in rural areas.

Alternatives for Rural Communities

Paralleling out-migration from agriculture is an out-migration from rural non-farm communities. Although Census data show show a population increase in Southeastern South Dakota of 6,898 for the 1950-60 period, the total rural population decreased by 10,816. Area 3B lost 6,929 residents while Area 4B gained by 13,827. The city of Sioux Falls population increase alone was 13,876. (See Table A14).

Out-migration during this period accounted for the loss of almost 33,000 potential inhabitants. The western part of the area shows the highest net out-migration. Only Minnehaha County had no loss from out-migration. Out-migration is the excess of births over deaths (See Table A15.).

Rural trading and social centers have had to adjust to the population losses cited above. A number of rural communities have formed area development committees and attempted to reduce the impacts of these changes and find other means to replace the population and income losses in the communities. Energetic local leadership in many communities has been effective at least in part in these efforts. It is possible that a greater degree of success may have been realized in some communities had their planning been more realistic and thorough, considered possible future population losses, and assessed more completely all the resources capable of development.

The findings in this study indicate the probability of continuing population losses from agriculture. In the absense of any new

developments influencing present trends and forces, it is possible that farm numbers in the area may fall to 75 percent of the present numbers within the next decade or so.

Continuing off-farm migration and increasing mobility of farm families will continue to affect the business and social activity and consequently the population level of the marketing centers. The effect of continuing population losses will be greater in rural nonfarm communities which are most dependent upon farm customers.

Evidence presented so far in this study shows the existence of a substantial reserve labor force on Southeastern South Dakota farms. It is quite likely that this human resource can be developed into a productive resource for industrial development. It appears that all rural areas have a sizeable potential labor pool which is presently not utilized in agriculture. The full extent of this resource appears to be greater than has generally been recognized. Active efforts at every community level to encourage development of the labor potential of area farms should reflect favorably upon the entire economy of the region.

Local and regional development committees can obtain advice and guidance from state and federal Rural Areas Development agencies. They are able to help local groups with advice on ways to develop plans and form local action committees, can offer technical assistance in locating and evaluating natural resources and possible markets and can assist in coordinating efforts and actions with neighboring communities. Under some circumstances financial assistance is available from other sources.

The three stages of Rural Areas Development programs are analysis, planning and action. The analysis stage should begin with an inventory of present and potential resources and a determination of economic trends in the area.

The farm population in rural communities has traditionally been the primary market for the goods and services of the trading centers. It will be of value to Rural Area Development committees also to recognize the presence of a potentially productive labor supply from the farm population in the area. Committees planning for future development could logically consider means of retarding the rate of migration, since it is considered probable that farm numbers in the area will continue to decline unless supplemental sources of income can be made available for underemployed farm workers.

Industrial development appears to be the conventional goal of most Rural Area Development plans. Communities can enhance their chances to attract industries if they can demonstrate the presence of a labor supply in the area. The initial procedure for a program to develop the labor resources in a community is to survey the skills present. It is likely that a training program will be needed to develop all the potential of the labor supply in the area to fit the requirements of industries suited to the natural resources in the region. In addition to an adult training program designed to increase specific skills for specific industries, long range educational goals should be directed toward improving the amount and quality of the training and education of young people. Glover describes expenditures on education

as "investment in human capital." He states that the quality of management on South Dakota farms and in South Dakota businesses has an important bearing on our ability to compete in the regional and national economy.[1]

Improved educational programs for young people and retraining programs for adults will not retard the rate of out-migration per se. If job opportunities are not available in the community, the more highly skilled workers will be among the first to move to other areas. The point is, however, without skilled management, there can be no jobs created for skilled workers. A conceivable immediate benefit for a community with a superior educational system may be that outside capital sources would consider this to be a manifestation of other desirable attributes.

Availability of part time jobs in the local community will be of special benefit to low income farmers as a means of increasing his level of income without expanding his operation or increasing his capital investment in agriculture.

There have been recent indications that the potential commuting range between home and work is enlarging. This should enhance the opportunity of rural communities to become employment centers for workers commuting into the center. There is the additional opportunity for at

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[1]Loyd Glover, "The Post High School Educational Needs of the Farm Population in South Dakota." Paper presented to the State College Advisory Committee, Sept. 28, 1963. South Dakota State College, Brookings, S.D. pp 1-2.

least some communities located a reasonable distance from larger employment centers to attract resident commuters who prefer to live in small towns.

This potential commuting range should have quite a number of favorable prospective advantages in South Dakota. A number of the smaller towns are located close to desirable recreational facilities such as hunting and fishing. Generally good roads should make commuting several miles daily feasible all year round. Quite possibly the superior educational system previously suggested would be the single greatest concern to prospective residents.

CHAPTER VI

SUMMARY AND CONCLUSIONS

The primary objective of this study was to determine the degree of underemployment on South Dakota farms as a consequence of technological advances. An analysis of labor resources and labor requirements on three hundred and thirty one farms sampled in southeastern South Dakota indicated that a considerable amount of available farm family labor resources are not fully utilized in agriculture. It appeared that with moderately higher levels of efficiency in agriculture and larger farms, the amount of nonutilized farm family labor would be even more extensive.

It was estimated that between sixteen hundred and twenty-nine hundred full time workers from Area 3B, and twenty-seven hundred to forty-two hundred workers from Area 4B would be potentially available for other employment from the farm families in southeastern South Dakota.

Underemployment of human resources has been shown to be, in general, a major factor in the income-resource problem of agriculture. The prevailing rate of migration away from farming supports the assumption that a considerable number of farmers were seeking other employment in order to increase their incomes. Rural population losses from migration are likely to continue. Many of the families leaving the farm and the region for other employment would probably prefer to stay in the area if jobs were available locally.

The problem of probable future population losses presents a challenge to community leaders and Rural Areas Development committees. An active campaign to promote and develop the human resources in rural communities could improve the opportunities for industrial and economic development in the area. Demonstrating the presence of a labor supply in the area is likely to encourage potential investment capital sources to become interested.

Increased availability of part-time and seasonal jobs could help maintain population levels in rural communities and retain residents who might otherwise migrate out of the area in search of employment.

Improved educational programs and facilities to enable rural young people and adults to gain skills needed in the modern economy will be of significant benefit to the community and to the entire state of South Dakota.

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APPENDIX TABLES

Table A1. Estimated Annual Overhead Labor Requirements by Size of Farm and Per Acre Requirements for Crops in Southeastern South Dakota

Overhead Labor	Man-Work Days Type of Farm Grain	Stock	Dairy
Under 180 Acres	38.0	49.0	45.0
180 - 259 Acres	43.0	60.0	54.0
260 - 339 Acres	49.0	72.0	63.0
340 - 499 Acres	56.0	86.0	70.0
500 Acres and Over	68.0	98.0	75.0

Hay	I/A	Stack	Bale	Chop
1 Cutting	.5	.11	.16	.14
	1.0	.15	.25	.19
	1.5	.19	.34	.26
	2.0	.23	.43	.31
2 Cuttings	1.5	.26	.41	.33
	2.0	.30	.50	.38
	2.5	.34	.59	.45
3 Cuttings	3.0	.45	.75	.57
	3.5	.49	.84	.64
	4.0	.53	.93	.71

Crops		Man-Work Days Mechanization High	Ave
Row Crops: (Corn, Sorghum, Soybeans)	Intensive	.38	.50
	Average	.30	.42
Add for Silage, per T/Acre		.12	.12
Small Grains:	Intensive	.24	.35
	Average	.20	.30
Add for Silage, per T/Acre		.10	.10
Annual Hay		.91	1.39
Summer Fallow; Diverted Acres		.06	.09
Irrigated Corn		.90	
Irrigated Small Grains		.60	
Irrigated Pasture		.52	
Irrigated Sugar Beets (Add crew labor hired)		3.30	

Table A2. Estimated Annual Labor Requirements Per Head for Livestock, by Size of Herd

	Days
Dairy Cows, Stanchioned	
1 - 10	13.50
11 - 15	10.50
16 - 20	9.50
21 - 25	9.00
26 - 30	8.50
31 - 40	8.00
41 - 60	7.50
61 - Over	7.00
Deduct for Gutter Cleaner and Pipeline System	.50
Deduct for Loose Housing and Walk-thru Parlor	1.00
Deduct for Loose Housing and Herringbone Parlor	1.50
Beef Cows, Farm Conditions	
1 - 20	2.50
21 - 30	2.00
31 - 50	1.50
51 - 80	1.20
81 - Over	.80
Cattle Pastured, 5 Months	
1 - 20	.30
21 - 40	.20
41 - Over	.10

	Days
Cattle Wintered, 7 Months	
1 - 20	1.26
21 - 40	.70
41 - 60	.42
61 - 80	.28
81 - Over	.21
Beef in Drylot, per Month	
1 - 20	.20
21 - 40	.10
41 - 60	.07
61 - 80	.06
81 - 100	.05
101 - 160	.04
161 - Over	.03
Brood Sows, 1 Litter	
1 - 10	3.00
11 - 20	2.50
21 - 30	2.00
31 - 40	1.50
41 - Over	1.20
Brood Sows, Farrow Twice	
1 - 10	5.00
11 - 20	4.00
21 - 30	3.00
31 - 40	2.75
41 - Over	1.80

	Days
Feeder Pigs, per Month	
1 - 40	.08
41 - 80	.05
81 - 120	.04
121 - Over	.03
Ewe and Lamb	
1 - 50	.50
51 - 100	.40
101 - 300	.30
301 - Over	.25
Feeder Lambs, per Month	
1 - 50	.04
51 - 100	.03
101 - 300	.02
301 - Over	.01
Laying Hens, per 100 Hens	
50 - 200	12.00
200 - 400	9.00
401 - 600	6.00
601 - 800	5.00
801 - 1000	4.00
1001 - 3000	3.50
3001 - Over	2.00

Table A3. S.E.S.D. Labor Requirements: Selected Crop and Livestock Enterprises Assuming Higher Mechanization and Specialization.

Crops, per Acre	MWU	Livestock, per Head	MWU
Row Crops	.30	Dairy Cows	7.50
Row Crops: - Intensive	.38	Beef Cow and Calf	2.00
Add for Silage, per T/Acre	.12	Cattle Wintered	.42
Small Grain	.20	Cattle on Pasture	.20
Small Grain: - Intensive	.24	Brood Sows, 1 Litter	2.00
Add for Silage, per T/Acre	.10	Brood Sows, Farrow twice	3.00
Fallow; Diverted Acres	.06	Feeder Pigs, per month	.04
Hay, 1 Cutting, 1 T/Acre	.19	Ewe and Lamb, farm flock	.30
Each additional T/Acre	.06	Feeder Lambs, per month	.02
Hay, 2 Cuttings, 1 T/Acre	.28	Beef in Drylot, per month	.05
Each additional T/Acre	.07	Laying Hens, per 100	6.00
Hay, 3 Cuttings, 3 T/Acre	.57		
Each additional T/Acre	.07		

Table A4. Per Acre Overhead Labor Requirements for Farms Less Than Average Size Assuming Larger Farm Sizes.

Area	Grain	Stock	Dairy
3B (Less than 390 Acres)	.15	.22	.18
4B (Less than 305 Acres)	.18	.24	.21

Table A5. Estimated Man-Work Days Required for Selected Machine and Custom Operations.

Machine	MWU	Machine	MWU
Baling, per Ton	.035	Cornpicker, 1 row	.120
Baling, per Acre	.045	Cornpicker, 2 row	.055
Combine, 6'	.060	Plow, 2-3 bottoms	.090
Combine, 7' - 10'	.050	Plow, 4-5 bottoms	.045
Combine, 11' and up	.030	Spraying weeds	.020
Field Cutting, Hay	.050	Spreading fertilizer	.020
Field Cutting, Row-crop	.125	Stack Moving, per ton	.040
Corn Picker-Sheller	.085	Windrower, 12' - 14'	.020

Table A6. Percent Change in Number of All Farms and Farms 50 Acres and Larger by Agricultural Census Period.

Area	All Farms			50 Acres and Larger		
	1945-50[a]	1950-54[b]	1954-59[c]	1945-50[d]	1950-54[e]	1954-59[f]
South Dakota	-3.3	-6.0	-10.9	-3.6	-5.7	-10.4
S. E. S. D.	-1.6	-2.9	- 8.7	-1.6	-2.8	- 8.7
Area 3B	-1.9	-1.9	- 8.3	-1.7	-2.5	- 8.1
Area 4B	-1.3	-3.6	- 9.0	-1.6	-3.1	- 9.1

Table A7. Farms Larger than 50 Acres; Percent of All Farms.

Area	1945[g]	1950[h]	1954[i]	1959[j]
South Dakota	95.0	94.7	94.8	94.9
S. E. S. D.	92.5	92.4	92.5	92.5
Area 3B	94.2	94.5	93.9	93.9
Area 4B	91.0	90.7	91.3	91.3

[a] 1950 Census of Agriculture. pp. 246-51.

[b] 1954 Census of Agriculture. pp. 226-31.

[c] 1959 Census of Agriculture. pp. 114-17

[d] 1950 Census of Agriculture. pp. 254-59.

[e] 1954 Census of Agriculture. pp. 241-46.

[f] 1959 Census of Agriculture. pp. 124-29.

[g] 1950 Census of Agriculture. op. cit.

[h] Ibid.

[i] 1959 Census of Agriculture. op. cit.

[j] Ibid.

Table A8. Number of All Farms 1954 and 1959;[a] Amount of Change and Percent Change; by County and Area.

	Number 1954	Number 1959	Change[b] 1954-59	Percent Change 1954-59
SOUTH DAKOTA	62,520	55,727	-6,793	-10.9
S. E. S. D.	22,719	20,510	-1,968	- 8.7
AREA 3B	10,373	9,411	- 860	- 8.3
Bon Homme	1,368	1,273	- 79	- 5.8
Charles Mix	1,567	1,426	- 124	- 7.9
Davison	892	755	- 124	-13.9
Douglas	883	821	- 51	- 5.8
Hanson	830	743	- 80	- 9.6
Hutchinson	1,683	1,585	- 90	- 5.3
McCook	1,324	1,226	- 78	- 5.9
Miner	1,007	884	- 118	-11.7
Sanborn	819	698	- 116	-14.2
AREA 4B	12,346	11,099	-1,108	- 9.0
Clay	1,153	984	- 162	-14.1
Lake	1,252	1,172	- 68	- 5.4
Lincoln	1,734	1,602	- 113	- 6.5
Minnehaha	2,320	2,041	- 253	-10.9
Moody	1,295	1,184	- 106	- 8.2
Turner	1,866	1,663	- 187	-10.0
Union	1,366	1,236	- 99	- 7.2
Yankton	1,360	1,217	- 120	- 8.8

[a] 1959 Census of Agriculture. pp. 114-117.

[b] Corrected for change in number of farms caused by change in definition of farm.

Table A9. Land in Farms, 1954 and 1959; Amount of Change and Percent Change; by County and Area.

	Acres 1954[a]	Acres 1959[b]	Change 1954-59	Percent Change 1954-59
SOUTH DAKOTA	44,949,473	44,850,666	-98,807	- .2
S. E. S. D.	6,185,880	6,154,585	-31,295	- .5
AREA 3B	3,433,600	3,423,121	-10,479	- .3
Bon Homme	356,169	352,009	- 4,160	-1.2
Charles Mix	680,929	686,669	5,740	.8
Davison	270,731	272,295	1,564	.6
Douglas	279,034	284,629	5,595	2.0
Hanson	267,992	259,885	- 8,107	-3.0
Hutchinson	518,501	518,505	4	0
McCook	360,787	363,080	2,293	.6
Miner	346,912	346,258	- 654	- .2
Sanborn	352,545	339,791	-12,754	-3.6
AREA 4B	2,752,280	2,731,464	-20,816	- .8
Clay	252,254	248,788	- 3,455	-1.4
Lake	345,908	344,785	- 1,123	- .3
Lincoln	361,382	354,988	- 6,394	-1.8
Minnehaha	502,115	491,584	-10,531	-2.1
Moody	318,995	323,323	4,328	1.4
Turner	386,399	384,851	- 1,548	- .4
Union	267,562	275,265	7,703	2.9
Yankton	317,665	307,880	- 9,785	-3.1

[a] 1954 Census of Agriculture. pp. 226-231.

[b] 1959 Census of Agriculture. pp. 114-117.

Table A10. Average Size of Farm in Acres, 1954 and 1959; Amount of Change and Percent Change; by County[a] and Area.

	Size 1954	Size 1959	Change 1954-59	Percent Change 1954-59
SOUTH DAKOTA	719.0	804.8	85.8	11.9
S.E. S.D.	272.3	300.1	27.8	10.2
AREA 3B	331.1	363.7	32.6	9.9
Bon Homme	260.4	276.5	16.1	6.2
Charles Mix	434.5	481.5	47.0	10.8
Davison	303.5	360.7	57.2	18.8
Douglas	316.0	346.7	30.7	9.7
Hanson	322.9	349.8	26.9	8.3
Hutchinson	308.1	327.1	19.0	6.2
McCook	272.5	296.2	23.7	8.7
Miner	344.5	391.7	42.2	13.7
Sanborn	430.5	468.8	56.3	13.1
AREA 4B	222.9	246.1	23.2	10.4
Clay	218.8	252.8	34.0	15.5
Lake	276.3	294.2	17.9	6.5
Lincoln	208.4	221.6	13.2	6.3
Minnehaha	216.4	240.9	24.5	11.3
Moody	246.3	273.1	26.8	10.9
Turner	207.1	231.4	24.3	11.7
Union	195.9	222.7	26.8	13.7
Yankton	233.6	253.0	19.4	8.3

[a] 1959 Census of Agriculture. pp. 114-117.

Table A11. Number of Farms by Size of Farm 1954 and 1959; Percent of all Farms; and Percent Change in Number of Farms 50 Acres and Larger.[a]

	1954			1959			
	Under 49 Acres	Over 50 Acres	% of All Farms	Under 49 Acres	Over 50 Acres	% of All Farms	Per-Cent Change
SOUTH DAKOTA	3,196	59,324	94.9	2,544	53,183	95.4	-10.4
S. E. S. D.	1,707	21,012	92.5	1,316	19,194	93.6	- 8.7
AREA 3B	629	9,744	93.9	456	8,955	95.2	- 8.1
Bon Homme	104	1,264	92.4	82	1,191	93.6	- 5.8
Charles Mix	100	1,467	93.6	72	1,354	95.0	- 7.7
Davison	108	784	87.9	46	709	93.9	- 9.6
Douglas	52	831	94.1	50	771	93.9	- 7.2
Hanson	44	786	94.7	32	711	95.7	- 7.9
Hutchinson	79	1,604	95.3	68	1,517	95.7	- 5.4
McCook	67	1,257	94.9	63	1,163	94.9	- 7.5
Miner	34	973	96.6	29	855	96.7	-12.1
Sanborn	39	780	95.2	14	684	98.0	-12.3
AREA 4B	1,078	11,268	91.3	860	10,239	92.3	- 9.1
Clay	118	1,035	89.8	89	895	91.0	-13.5
Lake	68	1,184	94.6	81	1,091	93.1	- 7.9
Lincoln	114	1,620	93.4	121	1,481	92.4	- 8.6
Minnehaha	265	2,055	88.6	187	1,854	90.8	- 9.8
Moody	85	1,210	93.4	67	1,117	94.3	- 7.7
Turner	169	1,697	90.9	114	1,549	93.1	- 8.7
Union	128	1,238	90.6	106	1,130	91.4	- 8.7
Yankton	131	1,229	90.4	95	1,122	92.2	- 8.7

[a] 1959 Census of Agriculture, pp. 124-129.

Table A12. Land in Farms by Size of Farm 1954 and 1959; and Percent of All Land in Farms 50 Acres and Larger.[a]

	1954			1959		
	Under 49 Acres	Over 50 Acres	% of All Land	Under 49 Acres	Over 50 Acres	% of All Land
SOUTH DAKOTA	52,282	44,897,191	99.9	48,056	44,802,610	99.9
S. E. S. D.	28,990	6,156,890	99.5	25,301	6,129,285	99.6
AREA 3B	9,891	3,423,709	99.7	8,439	3,414,683	99.8
Bon Homme	1,403	354,766	99.6	1,524	350,485	99.6
Charles Mix	1,709	679,220	99.7	1,429	685,420	99.8
Davison	1,569	269,162	99.4	954	271,341	99.6
Douglas	885	278,149	99.7	547	284,082	99.8
Hanson	817	267,175	99.5	503	259,382	99.8
Hutchinson	1,247	517,254	99.8	1,301	517,205	99.7
McCook	1,059	359,728	99.7	1,216	361,864	99.7
Miner	711	346,201	99.8	674	345,584	99.8
Sanborn	491	352,054	99.9	291	339,500	99.9
AREA 4B	19,099	2,733,181	99.3	16,862	2,714,602	99.4
Clay	1,591	250,663	99.4	1,467	247,321	99.4
Lake	1,083	344,825	99.7	1,589	343,196	99.5
Lincoln	1,850	359,532	99.5	2,216	352,772	99.4
Minnehaha	4,323	497,792	99.1	3,624	487,960	99.3
Moody	1,516	317,479	99.5	1,445	321,878	99.6
Turner	3,165	383,234	99.2	2,534	382,497	99.4
Union	2,591	264,971	99.0	2,295	272,970	99.2
Yankton	2,980	314,685	99.1	1,872	306,008	99.4

[a] 1959 Census of Agriculture. pp. 124-129.

Table A13. Estimated Number of Farms,[a] Land in Farms,[b] and Average Size of Farm, 1962, by County and Area.

	N' Total No. Farms	A' Total Acres Land in Farms	Ave. Size Acres
SOUTH DAKOTA	52,094	44,791,512	859.8
S. E. S. D.	19,455	6,136,954	315.4
AREA 3B	8,950	3,417,395	381.8
Bon Homme	1,229	349,542	284.4
Charles Mix	1,358	690,142	508.2
Davison	692	273,239	394.9
Douglas	793	288,053	363.2
Hanson	700	255,168	364.5
Hutchinson	1,534	518,505	338.0
McCook	1,183	364,465	308.1
Miner	822	345,866	420.8
Sanborn	639	332,415	520.2
AREA 4B	10,505	2,719,559	258.9
Clay	901	246,737	273.8
Lake	1,134	344,113	303.5
Lincoln	1,539	351,220	228.2
Minnehaha	1,907	485,398	254.5
Moody	1,126	325,955	289.5
Turner	1,563	383,926	245.6
Union	1,182	280,020	236.9
Yankton	1,153	302,190	262.1

[a] $N' = N_i + .6N_iP_i$ (N_i is No. Farms, 1959; P_i is Percent Change, 1954-59; Table A8)

[b] $A' = A_i + .6A_iP_i$ (A_i is Land in Farms, 1959; Table A9).

Table A14. Population of South Dakota and Southeastern South Dakota; 1950 and 1960; by Total, Urban and Rural.[a]

	Total Number		Number Rural		Number Urban	
	1960	1950	1960	1950	1960	1950
S. DAK.	680,514	652,740	413,344	436,030	267,180	216,710
S.E.S.D.	246,021	239,123	142,836	153,022	103,185	86,101
AREA 3B	76,784	83,713	64,229	71,590	12,555	12,123
Bon Homme	9,229	9,440	9,229	9,440	---	---
Charles Mix	11,785	15,558	11,785	15,558	---	---
Davison	16,681	16,522	4,126	4,399	12,555	12,123
Douglas	5,113	5,636	5,113	5,636	---	---
Hanson	4,584	4,896	4,584	4,896	---	---
Hutchinson	11,085	11,423	11,085	11,423	---	---
McCook	8,268	8,828	8,268	8,828	---	---
Miner	5,398	6,268	5,398	6,268	---	---
Sanborn	4,641	5,142	4,641	5,142	---	---
AREA 4B	169,237	155,410	78,607	81,432	90,630	73,978
Clay	10,810	10,993	4,708	5,656	6,102	5,337
Lake	11,764	11,792	6,344	6,639	5,420	5,153
Lincoln	12,371	12,767	9,860	10,237	2,511	2,530
Minnehaha	86,575	70,910	19,993	18,214	66,582	52,696
Moody	8,810	9,252	8,810	9,252	---	---
Turner	11,159	12,100	11,159	12,100	---	---
Union	10,197	10,792	9,461	10,239	736	553
Yankton	17,551	16,804	8,272	9,095	9,279	7,709

[a] U.S. Bureau of the Census. U.S. Census of Population: 1960 Number of Inhabitants, South Dakota. Final Report PC (1)-43A. U.S. Government Printing Office, Washington, D.C., 1960. p. 14.

Table A15. Net Migration 1950 to 1960[a] and Percent Change in Total, Urban and Rural Population 1950-1960.[b]

	Net Migration 1950 - 1960		Percent Change in Number 1950 - 1960		
	Out-Migration Total Numbers	Percent of 1950	Total	Urban	Rural
SOUTH DAKOTA	-93,962	-14.4	4.3	23.3	- 5.2
S. E. S. D.	-32,925	-13.8	2.9	19.8	-13.8
AREA 3B	-19,965	-23.8	- 8.3	3.6	-10.3
Bon Homme	- 1,522	-16.1	- 2.2		- 2.2
Charles Mix	- 6,578	-42.3	-24.3		-24.3
Davison	- 2,390	-14.5	1.0	3.6	- 6.2
Douglas	- 1,382	-24.5	- 9.3		- 9.3
Hanson	- 1,147	-23.4	- 6.4		- 6.4
Hutchinson	- 2,010	-17.6	- 3.0		- 3.0
McCook	- 1,954	-22.1	- 6.3		- 6.3
Miner	- 1,729	-27.6	-13.9		-13.9
Sanborn	- 1,253	-24.4	- 9.7		- 9.7
AREA 4B	-12,960	- 8.3	8.9	22.5	- 3.5
Clay	- 1,642	-14.9	- 1.7	14.3	-16.8
Lake	- 1,681	-14.3	- 0.2	5.2	- 4.4
Lincoln	- 2,014	-15.8	- 3.1	- 0.8	- 3.7
Minnehaha	10		22.1	26.4	9.8
Moody	- 1,631	-17.6	- 4.8		- 4.8
Turner	- 2,350	-19.4	- 7.8		- 7.8
Union	- 1,930	-17.9	- 5.5	33.1	- 7.6
Yankton	- 1,722	-10.2	4.4	20.4	- 9.1

[a] Riley, South Dakota Population, 1950-1960. pp. 4, 21.

[b] U.S. Bureau of the Census. U.S. Census of Population: 1960 General Social and Economic Characteristics, South Dakota. Final Report PC (1)-43C. U.S. Government Printing Office, Washington, D.C., 1961.